BLANK

PAGE

FILE COPY

Office - Supreme Court, U. S.
FILED
FEB 5 1938
CHARLES ELMORE CROPLEY
CLERK

Supreme Court of the United States

OCTOBER TERM, 1937.

No. 453

GENERAL ELECTRIC COMPANY,

Petitioner,

vs.

WABASH APPLIANCE CORPORATION, ABE ADLER AND ABE M. PARKER.

BRIEF FOR PETITIONER.

HUBERT HOWSON,
MERRELL E. CLARK,
ALEXANDER C. NEAVE,
Counsel for Petitioner.

Evening Post Job Printing Office, Inc., 20 Lafayette St., New York, N. Y.

BLANK

PAGE

INDEX

	PAGE
Jurisdiction	1
Statement of the Case	2
Prior Incandescent Lamp Filaments	3
Offsetting	3
Coolidge's Prior Invention for Preventing Offsetting	4
The fine-grained filament described by Coolidge "sagged"	5
Schaller's Single-Crystal Filament	6
The Pacz Patent—the Solution of the Problem	7
Infringement	10
The Lower Court Decisions upon the Validity of the Pacz Claims	11
The Errors Assigned and to be Relied Upon	13
Outline of Argument	13

ARGUMENT.

POINT I. The Coolidge Battersea defense has not been established	14
The Coolidge patent itself is definitely not an anticipation of the Pacz invention. All of the lower courts have concurred in this finding	14
Under these circumstances, respondents have assumed an extremely heavy burden in asserting anticipation by the Coolidge Battersea product	15
The "fact" testimony offered by respondents in support of their Coolidge Battersea defense, is worthless	18

PAGE

The "expert" testimony of Laise, offered by respondents in support of this Coolidge Battersea defense, is equally worthless..... 21

The Battersea Process, as Disclosed in the Coolidge Patent..... 22

The Difference between the Process Described by Pacz and by Coolidge..... 23

Laise's attempt to produce the Pacz result from the Coolidge Battersea process, involves modifying that process in accordance with the teachings of Pacz..... 25

Conclusion Concerning the Coolidge Battersea Defense 29

POINT II. None of the other prior patents relied upon by respondents affects the validity of the Pacz claims..... 30

The Schaller Patents..... 30

The Kruger Patent..... 31

The Earlier Pacz Patent, No. 1,299,017..... 33

POINT III. There was no prior knowledge or use of the Pacz invention..... 35

The Alleged Use by the Westinghouse Company. 37

The Alleged Prior Use by the Independent Lamp & Wire Company..... 39

Conclusion *re* Alleged Prior Uses..... 42

POINT IV. The Pacz claims in suit are not invalid for indefiniteness, or for insufficiency of disclosure. 42

Definiteness of Claims..... 42

Sufficiency of Disclosure..... 47

Findings of the Courts below upon Definiteness of Claims and Sufficiency of Disclosure..... 49

Conclusion 50

AUTHORITIES

	PAGE
Allen Filter Co. *v.* Star Metal Mfg. Co., 30 F. (2d) 693, reversed on appeal in 40 F. (2d) 252 (C. C. A. 3), certiorari denied 282 U. S. 848	46
Anraku *v.* General Electric Co., 80 F. (2d) 958, 961, 962 (C. C. A. 9); certiorari denied, 298 U. S. 678	2, 11, 43
A. B. Dick Co. *v.* Ba[illegible], 288 Fed. 799, 801 (C. C. A. 2)	48
Eibel Process Company *v.* Minnesota & Ontario Paper Company (1923), 261 U. S. 45, 50, 60, 66	19, 44, 45
Eibel Process Co. *v.* Remington-Martin Co., 234 Fed. 624, 632 (C. C. A. 2)	45
General Electric Co. *v.* Anraku, 10 F. Supp. 935, 938 (D.C. S.D. Cal.)	2, 11
General Electric *v.* Mallory, 298 Fed. 579, 588 (C. C. A. 2)	45, 46
Kuehmsted *v.* Farbenfabriken, 179 Fed. 701, 707 (C. C. A. 7)	48
Loom Co. *v.* Higgins, 105 U. S. 580, 586	47
Mumm *v.* Jacob E. Decker & Sons, 301 U. S. 168, 171	13, 15
Naylor, *et al. v.* Alsop Process Co., 168 Fed. 911, 920 (C. C. A. 8)	16, 21
Rynear Co. *v.* Evans, 83 Fed. 696, 697 (C. C., S. D. N. Y.)	48
Smith, Executor *v.* Hall, *et al.*, 301 U. S. 216, 222	19
The Barbed Wire Patent (1892), 143 U. S. 275, 284	18
Tilghman *v.* Proctor, 102 U. S. 707, 711	17
United States Code, Title 28, Section 347	1

BLANK

PAGE

Supreme Court of the United States

OCTOBER TERM, 1937.

No. 453

GENERAL ELECTRIC COMPANY,

Petitioner,

vs.

WABASH APPLIANCE CORPORATION, ABE ADLER and ABE M. PARKER.

BRIEF FOR PETITIONER.

The opinion of the Circuit Court of Appeals for the Second Circuit is reported at 91 F. (2d) 904. It will be found in this record at page 330.

The opinion of the District Court is reported at 17 Fed. Supp. 901. In this record it is at page 313.

Jurisdiction.

This case is here on a writ of certiorari to the Circuit Court of Appeals for the Second Circuit under the provisions of the United States Code, Title 28, Section 347. The petition for the writ was granted on November 8, 1937. The principal ground urged in support of the petition was that in this case the Circuit Court of Appeals for the

Second Circuit had rendered a decision concerning the validity of the patent claims in suit, which was in conflict with the previously rendered decision of the Circuit Court of Appeals for the Ninth Circuit in *Anraku* v. *General Electric Co.*, 80 F. (2d) 958,[1] concerning the validity of the same claims. The decision of the District Court (S. D. Cal.) in the Ninth Circuit case is reported at 10 F. Supp. 935.

Statement of the Case.

This is a patent infringement suit. The claims sued upon are claims 25, 26 and 27 of the Pacz patent, No. 1,410,499 (R. 246) which expires early next year. It was issued March 21, 1922 upon an application filed February 20, 1917. These claims are directed to a filament for incandescent lamps. They were held valid and infringed by the District Court (affirming the Special Master) and by the Circuit Court of Appeals in the Ninth Circuit case to which we have referred, and by the District Court in this case. But they were held invalid—erroneously, we think—by the Circuit Court of Appeals for the Second Circuit, in this case.

The filament covered by the Pacz claims in suit represents an important advance in the art and has been highly successful commercially. It is a tungsten filament and is characterized essentially by the fact that it is made up mainly of a number of comparatively large grains, or crystals, of such size and contour as to prevent substantial "sagging" and "offsetting" during a normal or commercially useful life in an incandescent lamp.[2] Exactly what this means from the standpoint of structure and properties will be more readily understood after we have

---

[1] Certiorari denied, 298 U. S. 678.

[2] Claim 25, which is representative, is quoted at page 9, *infra*.

developed briefly the prior art background of the Pacz invention.

Prior Incandescent Lamp Filaments:

The light-giving element in the incandescent electric lamp is a fine thread or filament of conducting material. In the original lamp invented by Edison this filament was made of carbon, but about 1906 the carbon filament was supplanted by the much more efficient tungsten filament (R. 13). These early tungsten filaments were of the "squirted" or "pressed" type, and were made by mixing tungsten powder with a binder, such as starch, into a plastic mass which was then squirted as a fine thread into loops. After these loops had been dried, a current was passed through them to heat them. This vaporized the binding material and caused the particles of tungsten to adhere to each other by a sort of incipient fusion, known as "sintering". Several loops were then assembled on supports, inside a glass bulb, to form an incandescent lamp filament (R. 13-14). While the squirted tungsten filament was a great improvement over the carbon filament, it was brittle and weak, and could not be made into long lengths or of accurate gauge (R. 15). One of the difficulties with it, which greatly shortened its useful life, was its proneness to "offset".

Offsetting:

By "offsetting" is meant the bodily shifting of one portion of the filament with reference to an adjacent portion, during the continued burning of the filament. These early filaments consisted of a number of grains, or crystals, many of which became large enough during use to extend all the way across the filament. The "offsetting", or shifting, took place along the boundary lines between adjacent crystals. Plaintiff's Exhibit 12, which is repro-

duced as Fig. 1 on the flyleaf at the back of this brief,[1] is a microphotograph of such a filament which has "offset". It shows graphically what is meant by that term. As the Court below put it, "offsetting" is (R. 331-332)—

> "like a slip at a geological fault line. The result is to reduce the cross-sectional area of the filament between the offset portions, causing it more readily to burn out or break."

Coolidge's Prior Invention for Preventing Offsetting:

The *squirted* tungsten filament which has just been described, was later supplanted by the Coolidge *drawn* tungsten filament which is disclosed in the Coolidge patent, No. 1,082,933 (R. 253). This patent discloses also how to make this filament from powdered tungsten oxid as a starting material. This Coolidge filament was strong, was ductile instead of brittle, and could be made in any desired length (R. 15). Furthermore, Coolidge took precautions to prevent its "offsetting".

In connection with offsetting, Coolidge pointed out that if the crystals are allowed to "become so large as to extend across the entire section of the filament * * * the sections may move laterally upon each other and produce the condition known as 'offsetting'" (R. 255, ll. 15-19). So he included in his process for manufacturing his new filament the step of incorporating certain additional chemical material with the tungsten oxid at an early stage of the process to "prevent coarse crystallization of the tungsten [in the final filament] at high temperature" (R. 262, l. 28). By keeping the crystals so small that none of them extended across the entire section of the filament, offsetting was prevented.

---

[1] This flyleaf may be unfolded so that all of the Figures on it will be visible while the brief is being read. Hereafter it will be referred to as "the flyleaf".

The microphotograph at Fig. 2 on the flyleaf (Plaintiff's Exhibit 19) shows a commercial Coolidge filament made by the process of his patent. It well illustrates the fine-grained filament which he produced in order to avoid offsetting.

The step of incorporating the proper additional chemical material with the tungsten oxid in order to bring about this result, may be carried out in two alternative ways, according to the Coolidge patent. One involves adding a substance such as thoria directly to the tungsten oxid (R. 260, ll. 1-19). The other involves heating the tungsten oxid in a Battersea crucible so that alumina and silica will be volatilized from the clay of the crucible and in that way be incorporated with the tungsten oxid.

The Coolidge patent indicates a preference for the Battersea process because of its greater simplicity (R. 260, ll. 29-35). But the thoria process was preferred commercially in this country because of its greater uniformity of result (R. 191). The Coolidge filament illustrated in Fig. 2 on the flyleaf was produced by the latter process.

The fine-grained filament described by Coolidge "sagged":

Although Coolidge solved satisfactorily the problem of "offsetting", it was found that his fine-grained filament "sagged" badly between supports, with continued use in an incandescent lamp (R. 22, 24, 25). Note, for example, the excessive droop or sag between supports of the coiled thoriated tungsten filament (Coolidge) in the photograph appearing as Fig. 3 on the flyleaf, taken after the lamp had been burned 115 hours. This sagging was objectionable not only because it deformed the filament from the position it was designed to maintain, but also because it reduced the efficiency of the lamp and might lead to its early failure (R. 24).

This is particularly true of coiled filaments (made by coiling a fine filament into a close spiral smaller than the

lead of a pencil). Tungsten is a very heavy material, practically as heavy as gold, so that there is a strong gravitational force tending to cause these coiled filaments to sag between supports when they reach incandescence. Accordingly, wherever coiled filaments are used the "non-sag property is very valuable" (R. 25). It is especially so in gas-filled lamps because in such lamps the sagging of the coiled filament and the consequent spreading apart of the coils allows the gas to circulate between those coils. This results in an undue cooling of the filament and a corresponding reduction in efficiency (R. 24, 25).

Efforts to overcome the evil effects of the Coolidge sagging filament by increasing the number of filament supports, led only to excessive heat losses and losses in efficiency, and necessitated a costly and inefficient construction (R. 24).

So while Coolidge solved the offsetting problem, *he did not solve the sagging problem.* The art was still in quest of a *commercially practical filament which neither offset nor sagged.*

Schaller's Single-Crystal Filament:

Schaller, another prior worker in the art (see Schaller patents, R. 306, 310, the applications for which were filed in 1914), was familiar with the two types of multi-crystal filaments to which we have referred and which are illustrated at Figs. 1 and 2, respectively, on the flyleaf. He described them (R. 307, ll. 15-20) as (1) filaments "consisting of consecutive large crystals, one joined to the other, and the breaking points between which can be clearly discerned with the naked eye", and (2) filaments "consisting of aggregations of very fine crystals". Apparently because of his familiarity with those two types of filament, he despaired of obtaining satisfactory results with any kind of multi-crystal filament. He said (R. 307, ll. 21-26) that it was "not possible to control the ultimate formation of crystals" and that "the crystals in the final

metal body are generally in a disordered state". So he proposed to avoid the problems involved in multi-crystal filaments entirely, by resorting to a complicated method of making a filament consisting of a *single crystal throughout its length.* Such a filament, having no crystal boundaries, could not offset, and it did not sag. But as the Court below found (R. 332)—

> "the method was too costly for general acceptance by the trade and found practical use only in small types of lamps, such as flash light and Christmas tree lamps".

So, in spite of the efforts of Coolidge and Schaller, *the problem of producing a commercial, practical, non-offsetting, non-sagging filament was still unsolved.* And, as the District Court said (R. 315), it

> "remained unsolved until Pacz made the invention of the patent in suit".

The Pacz Patent—the Solution of the Problem:

Pacz made a direct attack upon this problem without departing from what appeared to be the only commercially practicable type of filament, namely, the multi-crystal type. In his patent Pacz states the object and result of his invention as follows (R. 247, ll. 9-25):

> "The object of my invention is to produce tungsten metal which will retain to a much higher degree than heretofore its original properties after being subjected to high temperatures. In the case of incandescent lamp filaments, the high temperatures at which they are run have caused them to elongate and sag between their supports. This is especially noticeable in coiled filaments, and in gas-filled lamps this tends to reduce the efficiency of the lamp on account of the increased cooling effect on the filament. By means of my invention the sagging is substantially eliminated

> and 'offsetting' of the filament is substantially prevented, during a normal or commercially useful life of the lamp."

He also describes generally (R. 247, ll. 26-59) and specifically (*id*, l. 79, *et seq.*) a method for producing his novel filament, which consists in bringing *alkali silicate* into intimate association with the tungsten oxid at an early stage of the process. Since the only claims here in suit are *product* claims, we shall not discuss the process in further detail at this time.

The result of the Pacz process upon the final grain structure of the filament is *directly contrary to what Coolidge had taught was essential if offsetting was to be avoided*. Instead of producing a *fine-grained* structure, it produces one that is *coarse-grained*, and sufficiently so that at least some of the grains extend all the way across the filament—*the very condition that Coolidge taught led to offsetting*. The thing that prevents offsetting in this Pacz coarse-grained filament is the *contour* of the grains. As appears from the microphotograph of Pacz filament appearing as Fig. 5 on the flyleaf,[1] the contour of the grains is such that where the grains extend all the way across the filament, they are disposed angularly or in overlapping or interlocking relation, so that slippage cannot occur (R. 72). As Pacz puts it in his patent (R. 247, ll. 63-66)—

> "The coarse grained filament produced by means of my invention does not 'offset' so as to cut short the life of the lamp appreciably",

[1] The Pacz filament here illustrated represents petitioner's present commercial product made under the Pacz patent. Some of the details by which alkali silicate is added to the tungsten oxid in petitioner's present commercial practice differ slightly from those described in the patent; but there is no difference in principle (R. 229, 230), and filaments made in exact accordance with description of the patent are of the same character as the present commercial filament (R. 229).

which, of course, would not be true of a coarse-grained filament having boundaries extending straight across it, perpendicular to the axis of the filament.

Prior to Pacz, no one knew that the reason the fine-grained Coolidge filament sagged was because of its fine grain. Just as the art prior to Pacz was unaware that it was possible to produce a coarse-grained filament which would not offset, so too, so far as appears from this record, it was unaware that coarseness of grain in a multi-grain filament would cure sagging. But Pacz found that his coarse-grained filament with its irregularly contoured non-offsetting grains did not sag (Fig. 4 on flyleaf), and he stated in his patent (*id.*, ll. 60-62):

> "The probable reason why filaments made according to my invention do not sag, is that the structure is comparatively coarse grained."

This is now accepted as the true reason, although it is not yet fully understood why coarse-grained filaments do not sag.

So the filament of the Pacz patent, *which is the first multi-crystal, substantially non-sagging and non-offsetting filament known*, is one made up mainly of comparatively large grains, of such a size as to prevent substantial sagging, and of such a contour as to prevent substantial offsetting, during the normal or commercially useful life of a lamp in which it is used. It is described in this way in the claims (24, 25, 26) which are in suit. Claim 25, which is representative, reads as follows:

> "25. A filament for electric incandescent lamps or other devices, composed substantially of tungsten and made up mainly of a number of comparatively large grains of such size and contour as to prevent substantial sagging and offsetting during a normal or commercially useful life for such a lamp or other device."

Pacz called this filament number "218" because it was the product of his 218th attempt to solve the problem

in hand (R. 28). It is still frequently designated in that way.

The practical importance of this invention is attested by its outstanding and immediate commercial success, which began with its introduction to the market in 1915 (R. 28, 229). It has been used extensively throughout the world. In this country it has supplanted almost entirely all other forms of filament for incandescent filaments. More than 90% of all lamps now being sold are equipped with it. Over five billion lamps equipped with it have been sold in this country during the past twelve years alone (R. 37).

Infringement:

The infringement charged is the sale by respondents of lamps embodying filaments of the character defined by the Pacz claims in suit. That the filaments of those lamps are of that character is fully established by the record (R. 88) and was specifically found by the District Court (R. 322). The Circuit Court of Appeals did not comment upon the issue of infringement.

The record shows that respondents' filaments are composed of drawn tungsten containing substantially no impurities, that they are made up of coarse crystals of the irregular contour characteristic of the Pacz invention, and that upon burning they do not sag or offset (R. 88). It shows also that they fall directly within the Pacz claims (R. 99).

The microphotograph of respondents' filaments reproduced as Fig. 6 on the flyleaf, demonstrate how closely respondents' filaments resemble those made by petitioner under the Pacz patent, and illustrated in Fig. 5. The District Court, in holding infringement, said that the microphotographs showed that (R. 322) the defendants' filament was "exactly like the plaintiff's" and that the "qualities of the filaments were as alike as 'two peas in a pod'.".

The Lower Court Decisions upon the Validity of the Pacz Claims:

As has previously been stated, in the Ninth Circuit case, the Master, the District Court and the Circuit Court of Appeals concurred in holding that the Pacz claims here in suit define a patentable invention over the prior art. In the Special Master's report, which was adopted by the District Court, it was said (10 F. Supp. 935, 938):

> "*The cited art helps to add definition to the Pacz structure.*[1] It is distinguished readily from the Coolidge filament, in that the grain size is infinitely greater to the extent that sagging is eliminated. The contour of the grain boundaries is irregular (Exhibit 20) in contrast to the boundaries of prior large grain filaments, such as illustrated by Exhibit 10 [Exhibit 12 in present case, Fig. 1 on flyleaf]."

So, also, the Ninth Circuit Court of Appeals quoted with approval the following statement by the Special Master (80 F. (2d) 958, 962):

> "The prior art may be summed up to this effect: that 'offsetting' had been taken care of by Coolidge's teaching of a small grained structure; that sagging had been recognized as a problem by Pintsch [Schaller][2] for which he offered a solution by producing a filament of single grained structure. In all of the many patents and publications cited there is no suggestion that a large grained filament could be produced which would have the quality of resistance to both offsetting and sagging. A study of the prior art tends *to strengthen the patent rather than weaken it.*"

---

[1] Italics are ours throughout this brief.

[2] The Pintsch foreign patents which were before the Court in that case were counterparts of the Schaller U. S. patents in this case.

In the instant case, the District Court took the same view of the prior art and upheld the Pacz claims (R. 316-321).

But the Second Circuit Court of Appeals reversed the decree of the District Court and held those claims invalid *because of the Coolidge patent*. It recognized (R. 335) that:

> "* * * Coolidge taught the *retardation* of crystallization in order to prevent offsetting, while Pacz teaches the *growth* of crystals to prevent sagging and the formation of crystals of irregular contour to prevent offsetting."

"But" the Court added,

> "what Coolidge taught is immaterial with respect to the product claims in suit if the product of his Battersea treatment *was in fact* the same as that described in the claims in suit, for in that event the product so claimed was not new."

The Court then discussed some testimony of respondents' expert witness, Laise, which in fact shows only that one who is familiar with the Pacz process can modify the Coolidge Battersea process to make it simulate the Pacz process and that by the use of that modified process he can *sometimes* produce filament which is comparable, in grain structure and physical properties, with the Pacz 218 filament (*infra*, pp. 21-28). The Court stated also that

> "* * * Cowles and Laise testified to the production by the companies by whom they were employed of great quantities of the Battersea filament which was commercially non-sagging."

(As a matter of fact, such testimony as these witnesses gave along this line did not specify any dates and was entirely without corroboration or documentary support of any kind, *infra*, pp. 20, 21.) The Court concluded (R. 336):

> "* * * The Battersea treatment did not produce uniform lots, some sagged greatly, others only a

> little. The Pacz process gives more uniform production. But in so far as the patent in suit claims a new product, we think the claims in suit were anticipated by filament produced by the Coolidge Battersea crucible treatment."

All of the testimony upon which the Circuit Court of Appeals based this conclusion was given in open court at the trial of this case. The District Court which heard this testimony and took an active part in examining the witnesses, considered it too inconsequential to warrant mention in its opinion. We believe that the Circuit Court of Appeals, in accepting this testimony as establishing anticipation of the Pacz claims, violated flagrantly the well settled rule that a defense of this character can be established only by proof beyond a reasonable doubt, *Mumm* v. *Jacob E. Decker & Sons*, 301 U. S. 168, 171, *infra*, page 15. Here, in our view, there is not even any credible evidence to support the defense.

The Errors Assigned and to be Relied Upon.

The errors assigned in the petition for certiorari and to be relied upon are that the Circuit Court of Appeals erred:

1. In holding claims 25, 26 and 27 of the Pacz patent, No. 1,410,499, inval'd.

2. In failing to hold those claims valid and infringed.

Outline of Argument.

We shall first discuss the Coolidge defense along the lines already indicated, and shall then take up the other defenses upon which respondents relied below.

ARGUMENT.

POINT I.

The Coolidge Battersea defense has not been established.

The Coolidge patent itself is definitely not an anticipation of the Pacz invention. All of the lower courts have concurred in this finding:

As we have seen (*supra,* pp. 4-6), the Coolidge patent teaches that the way to overcome offsetting is by incorporating with the tungsten oxid at an early stage of the process, certain additional material (alumina and silica derived from the crucible in the Battersea process, or thoria added directly, in the other process). This, as stated by Coolidge, "will prevent coarse crystallization of the tungsten at high temperature" (R. 262, l. 28). Coolidge did overcome *offsetting* in this way. But his resulting *fine-grained* structure *sagged* badly (R. 25).

Pacz, on the other hand, did exactly what Coolidge "taught not to do" (R. 36). Pacz incorporated with the tungsten oxid different additional material (alkali silicate) which, in the final filament, *promoted* the growth of crystals, *large* in size, and of irregular *contour*. His product was a filament which *neither sagged nor offset.*

Both of the lower courts in the instant case, as well as both of the Ninth Circuit courts, concurred in finding this definite contrast between the Coolidge and the Pacz teachings. The District Court's finding in this case was (R. 316):

> "* * * The difference between the Pacz filament and the Coolidge filament was that Coolidge overcame 'offsetting' by adding small amounts of certain chemical materials at an early stage of the process which

> insured the maintenance of *small grains* in the final filament, while Pacz employed different chemical materials which produced the opposite effect of promoting in the final filament the growth of *large grains* of such contour that not only did it prevent 'offsetting,' as in the Coolidge filament, but solved the problem of 'sagging'.
>
> "The theory of Pacz was directly contrary to the prior teachings."

The finding of the Second Circuit Court of Appeals in this case, which we have already quoted, was (R. 335):

> "* * * Coolidge taught the *retardation* of crystallization in order to prevent offsetting, while Pacz teaches the *growth* of crystals to prevent sagging and the formation of crystals of irregular contour to prevent offsetting."

In view of these concurrent findings of the courts below, it is clear that the Coolidge patent, when taken at its face value, does not anticipate the Pacz invention, and does not show lack of novelty in that invention. Instead, it strongly emphasizes its novelty, as the Ninth Circuit Court of Appeals noted (*supra*, p. 11).

Under these circumstances, respondents have assumed an extremely heavy burden in asserting anticipation by the Coolidge Battersea product:

In every case where an infringer asserts the defense of lack of novelty in the patented invention, he assumes the burden of establishing that defense beyond a reasonable doubt. The most recent statement of that rule by this Court is in *Mumm* v. *Jacob E. Decker & Sons*, 301 U. S. 168, 171 (*supra*, p. 13), where it was said:

> "* * * the burden of proving want of novelty is upon him who avers it. Walker on Patents, § 116. Not only is the burden to make good this defense upon the party setting it up, but *his burden is a heavy one, as it has been held that 'every reasonable doubt should be resolved against him'.*"

Here, respondents' burden is particularly heavy because, as we have seen, their assertion that the Battersea process of the Coolidge patent in fact produces a filament with *coarse* grains, comparable to the Pacz filament, flies directly in the face of the teachings of that patent. Indeed, were it not for respondents' contention that the Coolidge Battersea process actually produced filament of that character *prior to the Pacz invention*, we doubt that evidence purporting to show that that process, in fact, produces just the opposite of what the patent says it produces, would be pertinent at all. For, as was said in *Naylor, et al v. Alsop Process Co.* (C. C. A. 8), 168 Fed. 911, 920:

> "When it is sought to ascertain the state of the art by means of prior patents, nothing can be used except *what is disclosed on the face of those patents.* Such patents cannot be reconstructed in the light of the invention in suit, and then used as a part of the prior art. That, however, is precisely what the defendants attempt to do in this case in respect to the Frichot patent. That patent disclosed ozone as the source of the nascent oxygen used for bleaching flour. Defendants say that, while such is the real character of the verbal disclosure on the face of the patent, the process actually produced nitrogen peroxide, which was in fact its bleaching agent. * * * There is nothing on the face of his patent to teach the world that nitrogen peroxide was an efficient agency for the bleaching and aging of flour. * * * *Prior patents are a part of the prior art only by what they disclose upon their face.* If they are carried into effect in the industrial world, what is learned from that experience also becomes a part of the prior art. An expert, however, cannot take a process patent, which has never been applied industrially, and work the process in his laboratory, and discover therefrom something which is not disclosed on the face of the patent, and then transfer that experience back to the time of the patent, and make it a part of the prior art for the purpose of defeating a meritorious invention. That would be *ex post facto* law of the most pernicious character. Such a practice would be

> especially misleading in a case like the present. The elements here involved are so numerous that a slight modification in the process would be likely to produce conspicuous changes in the product."

So the burden upon respondents of establishing anticipation of the Pacz claims by the Coolidge Battersea process, is an extremely heavy one. Accordingly, the testimony offered in support of that defense, whether it be "fact" testimony as to what was actually produced by that process prior to the Pacz invention, or "expert" testimony as to what that process will produce, must be subjected to the most careful scrutiny. And every reasonable doubt must be resolved against respondents.

The "fact" testimony, to be effective, must establish beyond reasonable doubt that prior to Pacz's invention workers in the art produced, by the Battersea process as disclosed by Coolidge, filament having the Pacz grain structure and properties, and that they did so intentionally and intelligently in the sense that they knew how to repeat those results. We add this last qualification because it is well settled that accidental results do not anticipate. Thus in *Tilghman* v. *Proctor,* 102 U. S. 707, 711, this Court rejected evidence relied upon for anticipation, saying:

> "* * * If the acids were accidentally and unwittingly produced, whilst the operators were in pursuit of other and different results, without exciting attention and without its even being known what was done or how it had been done, it would be absurd to say that this was an anticipation of Tilghman's discovery."

And the "expert" testimony must establish with the same high degree of certainty that the Battersea process, *when carried out exactly as taught in the Coolidge patent,* produces a filament comparable with the Pacz filament.

As we shall now see, none of this testimony, whether "fact" or "expert", is of any probative value in support of this defense.

The "fact" testimony offered by respondents in support of their Coolidge Battersea defense, is worthless:

This testimony purports to show that some of the Battersea filament that is said to have been made nearly twenty-five years ago, and before the Pacz invention, did not sag substantially. Being purely "recollection testimony", unsupported by contemporaneous documentary evidence, it carries no weight in establishing this asserted defense of prior use.

In *The Barbed Wire Patent* (1892), 143 U. S. 275, 284, it was said:

> "* * * We have now to deal with certain unpatented devices, claimed to be complete anticipations of this patent, the existence and use of which are proven only by oral testimony. *In view of the unsatisfactory character of such testimony, arising from the forgetfulness of witnesses, their liability to mistakes, their proneness to recollect things as the party calling them would have them recollect them, aside from the temptation to actual perjury, courts have not only imposed upon defendants the burden of proving such devices, but have required that the proof shall be clear, satisfactory and beyond a reasonable doubt.* Witnesses whose memories are prodded by the eagerness of interested parties to elicit testimony favorable to themselves are not usually to be depended upon for accurate information. The very fact, which courts as well as the public have not failed to recognize, that almost every important patent, from the cotton gin of Whitney to the one under consideration, has been attacked by the testimony of witnesses who imagined they had made similar discoveries long before the patentee had claimed to have invented his device, has tended to throw a certain amount of discredit upon all that class of evidence, and to demand that it be subjected to the closest scrutiny. Indeed, the frequency with which testimony is tortured, or fabricated outright, to build up the defense of a prior use of the thing patented, goes far to justify the popular impression that the inventor may be treated as the lawful prey of the infringer."

In *Eibel Process Company* v. *Minnesota & Ontario Paper Company* (1923), 261 U. S. 45, 60, the Court said:

> "* * * It is true that some witnesses testify that they realized before Eibel's application that speeding up the stock to equal velocity with the wire would solve the difficulty and aid the speed. *But there is not a single written record, letter or specification of prior date to Eibel's application that discloses any such discovery by anyone,* or the use of the pitch of the wire to aid the speed of the machine. The oral evidence on this point falls far short of being enough to overcome the presumption of novelty from the granting of the patent. The temptation to remember in such cases and the ease with which honest witnesses can convince themselves after many years of having had a conception at the basis of a valuable patent, are well known in this branch of law, and have properly led to a rule that evidence to prove prior discovery must be clear and satisfactory."

In *Smith, Executor* v. *Hall, et al.,* 301 U. S. 216, 222, after reviewing the oral testimony offered in support of a prior use defense, the Court said:

> "* * * This oral testimony, if taken at its face value, would show that the Smith method was used in the Brooklyn incubator with eggs in staged incubation. But *without corroboration,* it is insufficient to establish prior use, *Barbed Wire Patent,* 143 U. S. 275, 284; *Deering* v. *Winona Harvester Works,* 155 U. S. 286, 300; *Eibel Process Co.* v. *Minnesota & Ontario Paper Co.,* 261 U. S. 45, 60, and we turn to the *documentary evidence* that Hastings knew the method of the patent and used it in his Brooklyn structure."

The only comment by the Circuit Court of Appeals in this case upon the fact testimony offered by respondents in support of their Coolidge Battersea defense was (R. 336):

> "* * * Cowles and Laise testified to the production by the companies by whom they were employed of great quantities of the Battersea filament which was commercially non-sagging."

Let us examine this testimony. Cowles' testimony upon which respondents relied below in this connection, was to the effect that he was employed by the Independent Lamp & Wire Company from 1912 to 1920 (the Pacz application was filed in February, 1917, and the commercial manufacture of Pacz filament was commenced in the Summer of 1915, R. 229), and that while he was so employed (R. 119):

> "We used the Battersea material instead of the thoriated material because that seems to give a better —did not sag and produced a filament that would stand up better in the C type of lamp."

No date is given, no record evidence of any kind, no microphotograph of any filament alleged to have been produced in that way, and nothing from which the amount of sag can be determined. But Cowles did say that in using the Battersea process they (*id.*)—

> "*ran into trouble, when they began making the coiled wire filaments, having the filament sag,* some lots would sag and some would not. So in trying to eliminate that and getting a real constant metal that would be true to form each time, why, *we left the Battersea Crucible material and tried to improve upon it, by adding the different materials, other materials, to make it better.*"

Certainly this Cowles testimony cannot be given any weight in support of this prior use defense. And Laise's testimony is no better. The portion of it which respondents quoted in their brief below was merely this (R. 152):

> "* * * we produced millions of meters of Coolidge filament with the Battersea process that was commercially non-sag filament, and by making these sag tests we would eliminate, or we could eliminate the high sagging lots of metal from those that had very little sag. And we usually confirmed these sag tests by making preliminary lots of lamps commercially from a particular lot of wire, and then if these

> lamps show[ed] an excessive sagging commercially those lots of wire were not used for filament manufacture at that time."

Laise did not even say who "we" were or when "we" did these things. And again, there is not a scrap of documentary corroboration of the witness' "recollection" concerning events which are put forward as having occurred more than twenty years ago. Laise, we might add, is now in the business of manufacturing tungsten filament, and supplies respondents with filament for their lamps (R. 201, 148). He also served as respondents' expert in this case.

Further comment upon respondents' "fact" testimony in support of their Coolidge Battersea defense, is believed unnecessary. In the light of the rule stated in the above quoted decisions of this Court, this loose oral testimony should, we think, be disregarded entirely.

The "expert" testimony of Laise, offered by respondents in support of this Coolidge Battersea defense, is equally worthless:

This testimony is of the *ex post facto* character that was so strongly condemned in *Naylor, et al.* v. *Alsop Process Co.* (C. C. A. 8), 168 Fed. 911, 920, *supra*, page 16. It was given by Laise, in his capacity as respondents' expert. It purports to show that the product of the Battersea process described in the Coolidge patent, is not the fine-grained filament disclosed on the face of that patent, but is just the opposite—a coarse-grained filament, comparable to the Pacz filament in grain structure and properties. But as we shall see, the Battersea process that Laise was talking about was *not* the Battersea process of the Coolidge patent, but a Battersea process *reconstructed by Laise in accordance with the Pacz teachings.* And even that reconstructed process was far from dependable for the production of filament of the character of Pacz's.

So this "expert" testimony should be classed with the "fact" testimony, as valueless.

Before describing the Battersea process, as reconstructed by Laise in accordance with Paez's teachings, we shall describe in greater detail than we have done heretofore, the essential steps of the Battersea process, *as disclosed in the Coolidge patent.*

The Battersea Process, as Disclosed in the Coolidge Patent:

Coolidge starts with "tungstic oxid (WO_3)[1] as pure as commercially obtainable" and subjects it to an ammonia and heat treatment whereby it is still further "purified". It is the "tungstic oxid thus purified"—a powder—which he heats in a Battersea clay crucible (R. 255, ll. 62-74). During this heating operation certain additions consisting "largely of *alumina and silica*", are volatilized from the crucible and thus incorporated with the tungsten oxid (ll. 75-82). The amount of these additions should be within certain stated limits, and if upon analysis it is found that less is present, the heating operation should be repeated (ll. 82-90).

The tungsten oxid is then removed from the crucible and subjected to an extended heating operation at high temperature in the presence of hydrogen, the result of which is to convert the tungsten oxid into powdered tungsten metal. This metal is then pressed into steel molds, by hydraulic pressure, to form it into briquettes. These briquettes or sticks are subjected to additional heat treatments in the presence of hydrogen. The last of these is a "sintering" treatment which consolidates the tungsten powder into a solid slug or ingot of tungsten metal which may be, say, ¼ of an inch square and 6 inches long (R. 255, l. 93; R. 256).

---

[1] Sometimes called also "tungsten oxid" or "tungstic acid".

"The next step", as the patent says, "is the mechanical working" (R. 256, l. 71). This consists in swaging and wire drawing operations by which the ¼ inch slug or ingot is finally reduced to the extremely fine tungsten filament which may be as small as "0.5 mil", (R. 257, l. 88) which means 0.0005 of an inch, in diameter.

The product immediately resulting from the mechanical working operations is not crystalline at all, but fibrous in construction. It is when this filament is heated, as by the passage of electric current through it after it has been built into a lamp, that the grain structure forms. And it is then that the presence of the alumina and silica which were derived from the Battersea crucible at the first stage of the process comes into play and "retards crystallization" (R. 259, l. 128; R. 237, 238) or as it appears in Coolidge's claim 14 (R. 262) acts to "prevent coarse crystallization of the tungsten at high temperature" (R. 262). It is in this way that Coolidge prevents offsetting by insuring a *fine-grained* structure.

The things particularly to be remembered about this Coolidge Battersea process are (1) that the additions which are incorporated with the tungsten oxid from the Battersea crucible are *alumina and silica* and (2) that their function is *to prevent coarse crystallization* of the tungsten in the final filament.

The Difference between the Process Described by Pacz and by Coolidge:

The difference between the process described by Pacz and the Battersea process described by Coolidge is at the beginning of the operation. From the point of forming the metal slug or ingot to the production of the final filament, Pacz suggests following the Coolidge procedure (R. 248, ll. 86-91; R. 243). But at the beginning of his process, Pacz, instead of heating his tungsten oxid in a Battersea crucible to add alumina and silica to it, treats it in a different way so as to incorporate intimately with

it, a chemical compound of silica *and alkali*, known as *alkaline silicate*, or *alkali-silicate* (R. 248, l. 3). This alkali-silicate is present only temporarily, being removed by volatilization during the sintering operation by which the tungsten slug or ingot is formed (R. 247, l. 41; R. 242), so that the final filament contains practically none of it.[1] But for some inexplicable reason, its influence carries on (R. 242) "so that when that ingot is worked down into wire and heated, the filament so produced develops these *large* [Pacz] crystals" which prevent both offsetting and sagging. These large crystals develop almost immediately upon the heating of the filament (R. 29).[2]

So, broadly speaking, the important point of difference between the Battersea process described by Coolidge and the Pacz process is that Coolidge adds alumina and *silica* at the beginning of his process, whereas Pacz adds *alkali-silicate* at the beginning of his. The resulting difference in product is that the *Coolidge* filament is *fine-grained* and therefore does not offset but sags, while the Pacz filament has the *coarse*, irregularly contoured grains already described, and neither sags nor offsets.

---

[1] Indeed, the final filament may contain less than "one twentieth of one per cent" of non-metallic material of all kinds (patent, R. 248, l. 80). The Circuit Court of Appeals, forgetting that the alkali-silicate is volatilized during the process, thought erroneously that this statement in the patent meant that the amount of alkali-silicate required to be incorporated with the tungsten oxid initially was exceedingly small (R. 335).

[2] Lamps embodying these filaments are customarily subjected to a very short period of incandescence at the factory before being shipped. This is known as "flash aging". Such a preliminary heat treatment is described in the Pacz patent (R. 248, ll. 91-102). By the time the flash-aging is completed the filaments have achieved the Pacz large-grained, non-offsetting, non-sagging structure (R. 28, 29).

Laise's attempt to produce the Pacz result from the Coolidge Battersea process, involves modifying that process in accordance with the teachings of Pacz:

The obvious way to make the Coolidge Battersea process simulate the Pacz process is to inject at the beginning of the operation, in addition to the alumina and *silica* that are derived from the crucible, enough *alkalis* to combine with the *silica* to form the *alkali-silicate* which Pacz taught would do the trick. Laise, respondents' expert, adopted precisely this expedient.

But instead of frankly adding the necessary alkalis as such, Laise adopted the subterfuge of adding them as *impurities* in the tungsten oxid with which the process is started.

In this connection Laise explained that there are various methods in use for manufacturing commercial tungsten oxid (R. 198, Q. 196); that one of these methods involves precipitation of that material from alkali tungstates (R. 197, Qs. 190-194); that tungsten oxid made in this particular way contains residual alkalis (R. 210, Q. 305); that when this impure tungsten oxid is used in the Battersea process, its residual alkalis will combine with the silica from the crucible to form alkali silicates (R. 210, Qs. 305, 309); and that therefore when he (Laise) said that the Coolidge Battersea process produces the product described in the Pacz patent "under certain conditions" (R. 212-213, Q. 331), he meant that it does so (Q. 332)—

> "provided the tungsten oxid started with has been precipitated from alkaline tungstate".[1]

---

[1] Laise had previously suggested that certain small amounts of alkali-silicate might be derived from the Battersea crucible itself (R. 193). But he did not press that suggestion in this final statement on the point. Dr. Jeffries, petitioner's expert, showed that not more than a minute amount of alkali silicate could come from this source (R. 239).

In suggesting this seemingly inconspicuous way of introducing the necessary alkali into the Battersea process, Laise apparently overlooked the fact that Coolidge does not countenance using commercial tungsten acid "as is", even though it be "as pure as commercially obtainable". Instead, he insists upon its being "purified", before it enters into the process (*supra,* p. 22). Therefore, as Dr. Jeffries explained, if the Coolidge disclosure is followed, no alkalis can enter the process as impurities in the tungsten oxid (R. 239, 240).

So in order to get the Pacz alkali silicate into the Battersea process, in an attempt to secure the Pacz result, Laise must *depart from the Coolidge disclosure in two important respects, and thus reconstruct the Coolidge process in the light of Pacz's teachings.* In the first place he must select for his starting material a tungsten oxid containing alkali as an impurity (instead of selecting it on the basis of its *purity*), and he must then omit Coolidge's purification step, in order that that impurity may find its way into the process.

Clearly, the Coolidge Battersea process as so modified, is *not* the Coolidge Battersea process at all. It is merely a clumsy attempt to follow the teachings of Pacz while using the Battersea crucible as the source of silica for producing the Pacz alkali silicate.

This testimony does not advance respondents' case in the slightest.

Nor do the microphotographs appearing on Defendants' Exhibit K, which Laise testified represent filaments that were made in the course of *ex parte* tests "supervised" by him for the purposes of this trial (R. 217). Three of these filaments were said by Laise to have been made by the Battersea process "strictly in accordance with the Coolidge patent 1,082,933" (R. 151, Q. 89). But no details were given as to what was actually done in the carrying out of those tests, and no attempt was made to corroborate his testimony about them in any respect. The

person or persons who conducted them under Laise's supervision were not even called to testify about them. Under these circumstances, the alleged results of these tests should, we think, carry little, if any, weight, irrespective of what they purport to show.

But the Court of Appeals appears to have attached great weight to them particularly because it thought that two of these three supposedly "Battersea" filaments were comparable with Pacz filaments in grain-structure and non-sag properties (R. 335, 336). Whether they were or not, seems to us to be wholly immaterial. For we know from the testimony of this witness Laise, to which we have referred above, that his present, "post-Pacz" conception of the Coolidge Battersea process is *not that Coolidge process at all,* but a Battersea process *modified by the addition of alkalis so as to take advantage of the Pacz teachings.*

That only *two,* out of an *unnamed* number of lots of filament produced in this way, bear any resemblance to the Pacz filament, is significant. It may be because, as Laise suggested (R. 193), the Battersea process does not lend itself to such an intimate incorporation of ingredients with the tungsten oxid as does the process suggested by Pacz. Or it may be because the alumina which is introduced from the Battersea crucible and which, so far as appears, is not altered by Laise's addition of alkalis, continues to exert its effect of *retarding* grain growth in opposition to the alkali-silicate which is trying to *encourage* grain growth.

But in any event, Defendants' Exhibit K, and the Laise testimony concerning it, emphasize the uncertain and unsatisfactory character of the Battersea process even when it is *reconstructed by Laise in the light of Pacz's teachings.*

Of course workers in the art prior to Pacz did not have the advantage of Pacz's teachings for application to the Battersea process. On the contrary, they had been taught to avoid coarse crystallization; and they had no

idea that the addition of alkali silicate would have a beneficial effect of any kind. Therefore, they would have had no possible incentive to reconstruct the Coolidge Battersea process as Laise has done. No incentive for selecting a tungsten oxid containing a particular kind of impurity, instead of the purest obtainable. And no incentive for omitting Coolidge's purification step. Instead, they would have used the Battersea process just as it is described in the Coolidge patent, and would have produced thereby the result which Coolidge disclosed, namely, a fine-grained non-offsetting (but sagging) filament, and *not* the large-grained, non-offsetting and non-sagging filament of the Pacz patent.

Anticipation of the Pacz invention by the Coolidge Battersea product has *not* been shown.

An interesting commentary upon the Laise testimony in support of the Coolidge Battersea defense, is furnished by his testimony concerning his own present commercial operations. As we have said, Laise is now engaged in manufacturing tungsten filament commercially and in supplying it to respondents for their lamps. The Coolidge patent expired in 1930 so that Laise is free to make full use of the processes which it discloses. His testimony shows, however, that although he finds it necessary to produce a filament having large grains, as taught by Pacz, *he does not employ the Coolidge Battersea process for that purpose.* Instead, he subjects wire made by that process "to a certain heat treatment embodying the teachings of Schaller and *producing* larger grains", and he adds also "improvements of our own" which he *did "not care to disclose at this time."* (R. 206, Qs. 281-288).

Because of this testimony, the District Court felt constrained to characterize respondents as "neither sincere nor frank" (R. 322).

Conclusion Concerning the Coolidge Battersea Defense:

The evidence upon which the Circuit Court of Appeals based its conclusion that the product of the Coolidge Battersea process anticipated the Pacz claims, was not of such character as to warrant such a conclusion. The Coolidge patent states unequivocally the result of following the Battersea process. The testimony of respondents' expert witness that that process actually achieves a diametrically opposite result, does not even tend to establish the truth of that assertion because, as we have seen, he was not talking about the Battersea process of the Coolidge patent, but about a Battersea process reconstructed in accordance with Pacz's teachings. And the testimony of the two fact witnesses that the Coolidge Battersea process actually produced non-sagging filament prior to the Pacz invention is equally futile, being indefinite, undated, and wholly without corroboration, either oral or documentary.

It is our view that respondents have not only failed to establish anticipation by the product of the Coolidge Battersea process beyond a reasonable doubt, but have failed to offer any credible evidence in its support. The fact that the District Court which heard this testimony did not even mention it in its opinion, indicates that it held the same view.

POINT II.

None of the other prior patents relied upon by respondents affects the validity of the Pacz claims.

The Schaller Patents:
(R. 306, 310)

These patents for a *single crystal filament* have been referred to above (pp. 6-7). The Circuit Court of Appeals' complete comment upon these patents is (R. 332):

> "* * * The patents to Schaller, issued in 1918 on applications filed in 1914, taught the production of a filament consisting of a single crystal throughout its whole length. This prevented both sagging and offsetting, but the method was too costly for general acceptance by the trade and found practical use only in small types of lamps, such as flash light and Christmas tree lamps."

The District Court had previously said in this connection (R. 320):

> "The Schaller patent, as already indicated, taught the world to keep away from multi-grained filaments because they could not be controlled. The patent in suit taught the opposite theory. It has been proved that the Schaller patent was not a success commercially or otherwise and taught the art nothing of a substantial nature. Certainly, it did not teach the theory contained in the Pacz patent."

These concurrent findings would seem to dispose effectively of the Schaller patents as a defense against the Pacz claims. Schaller's conclusion that the only way of securing a non-sagging, non-offsetting filament was to discard the multi-grain structure, enhances the importance of Pacz's achievement in securing that result with such a structure.

The Kruger Patent:
(R. 304)

This patent contains no teaching whatsoever concerning the invention of the patent in suit. It suggests adding boric acid to tungsten filaments to "expel the air or other gas present from the minute interstices between the tungsten particles" (R. 304, ll. 33-35). There is no discussion of the sagging problem, or of the offsetting problem. There is no claim that the addition of boric acid has any effect upon the crystal characteristics of the filament. The patent did not advance the art one iota with respect to the problems which faced Pacz.

So far as appears, no one has ever produced any filament in accordance with the disclosure of this patent. Respondents argue that this patent is pertinent because the Pacz patent, as issued, contained a description of a filament made by adding boric acid to tungsten oxid. The portion of the Pacz patent to which they refer is as follows (R. 248, ll. 52-65):

> "* * * I have produced a metal differing in appearance and physical characteristics from '218' metal by adding a solution of boric acid to chemically pure WO_3, evaporating, drying, igniting and reducing. The metal thus produced when made into wire is not superior to '218' in non-sagging or non-offsetting characteristics, but a combination of this method with that for producing '218' in which the WO_3 from the latter is mixed with that from the former produces a metal which I term 'Z' and which is efficacious in the production of non-sagging and non-offsetting filaments."

The sum and substance of this is that the metal produced by the boric acid process, which is of unstated structure and physical characteristics, may be mixed with Pacz "218" metal for the production of non-sagging and non-offsetting filaments. It does not state or imply that filament made by this process is, *per se*, a commercially use-

ful non-sagging and non-offsetting filament. And Dr. Jeffries testified that it is not, but is "extremely brittle when cold" and that it sags (R. 227).[1] In order to avoid any possible misunderstanding on this score, petitioner filed a disclaimer to the Pacz patent on November 10, 1933, disclaiming (R. 251):

> "so much of the statement on lines 52 to 59 of page 2 of the printed patent specification as might imply or tend to imply that by 'adding a solution of boric acid to chemically pure WO_3, evaporating, drying, igniting and reducing' alone, it is possible to produce commercially useful non-sagging and non-offsetting tungsten filaments."

The Circuit Court of Appeals confined its comment on the Kruger patent to the following (R. 332-333):

> "* * * In 1915 Kruger obtained a process patent for the production of tungsten filaments with a boron compound, which the defendant contends produced a non-sagging and non-offsetting filament because Pacz had so asserted in the patent in suit—a statement disclaimed by the plaintiff in 1933."

As we have seen, respondents' contention as here stated by the Court, is completely refuted by the fact that Pacz never "so asserted in the patent in suit" and by the evidence in the record concerning the inadequacy of the metal product of the boric acid process that was originally described in that patent.

---

[1] One of respondents' witnesses testified that filament which he said he had made according to the Pacz boric acid method, sagged and offset to about the same degree as a filament which he said he had cooperated in making in accordance with the Pacz "218" process (R. 179). But he characterized the latter as "very poor from the present interpretation of a good non-sag structure" (R. 175). We shall comment on this latter filament later, *infra*, page 47.

There is no reason for disturbing the holding of the District Court overruling this Kruger defense (R. 320).

The Earlier Pacz Patent, No. 1,299,017: (R. 266)

This earlier Pacz patent was applied for in May, 1914, and issued in April, 1919. The Pacz patent in suit was applied for in February, 1917, and issued in March, 1922. Therefore, the applications for these two patents were copending in the Patent Office.

Respondents contend that this earlier Pacz patent invalidates the claims in suit of the later one on the ground of double patenting. To sustain this defense respondents must show that the claims in suit cover the *same invention* as the one described and claimed in the first patent. This they cannot show because *the earlier patent neither describes nor claims the invention of the Pacz claims in suit.*

The distinction between the invention of the Pacz claims in suit and that covered by the earlier Pacz patent is the same as that already pointed out between the invention of those claims and the prior Coolidge filament. As the District Court put it (R. 321):

> "Pacz, in his earlier patent, followed the same theory as Coolidge which indicated that the only way to prevent 'offsetting' in a multi-grained filament was to avoid coarse grains and insure a finely granular structure."

In support of this statement the District Court quoted the latter part of the following excerpt from the earlier Pacz patent (R. 268, l. 121—R. 269, l. 9):

> "My wire also showed no tendency to offset. I have found that a test which may be applied to wire which will show whether it will offset in the lamp is to give it what is known as the cross-section test. For this test a rod of a metal of 80 mils in diameter is heated for 8 minutes in hydrogen at a temperature close to

> the melting point of tungsten. The rod is then fractured and the cross-section examined. If the cross-section is shiny or shows *coarse grains,* the filament will offset. On the other hand, if the structure is *finely granular,* the filament will not offset. Rods produced from the metal, as above described, when subjected to this test had cross-sections which were finely granular.''[1]

There can be no question that in this earlier patent, Pacz was following the teachings of Coolidge that if offsetting was to be prevented coarse-grains must be avoided, and that a finely-granular structure was essential. It will be noted that the product claims of this earlier patent (claims 13-17) significantly avoid any statement that the filament does not sag.

In contrast with what is described and claimed in the earlier Pacz patent, the Pacz patent in suit, as we have seen, describes a *coarse-grained* filament which, because of the peculiar contour of its grains (and in spite of their size) does not offset, and which, because of the large size of its grains, does not sag. And it is to such a filament that the Pacz claims in suit are directed. Instead of being

---

[1] Respondents argued below that ''rod'' here referred to is the *ingot* and that the fine-grain of this ''rod'' is therefore of no significance. We agree that the grain structure of an *ingot* is not significant in indicating what the grain structure will be of materials made from the ingot by mechanical working, and that it is in the grain structures of the latter we are interested (R. 220, 221). But the ''rod'' referred to in the above quotation from the earlier Pacz patent is *not* the ingot. On the contrary, it is the tungsten *after* it has been swaged, worked and drawn down *from* the ingot, which is about ¼ of an inch square (*supra,* p. 22), to a rod or wire of the specified diameter of 80 mils (about 1/12 of an inch), and after it has then been heated to crystallize it. Therefore, at the time when the test described in the patent is made, *the rod has all of the grain characteristics of the finished tungsten filament.*

the same invention as the "finely granular" structure of the earlier Pacz patent, it is the very antithesis of that invention. The defense of "double patenting" is, therefore, wholly without merit.

This earlier Pacz patent merely represents one of Pacz's unsuccessful attempts to solve the problem of a commercial non-sagging, non-offsetting filament. Its product became available prior to the discovery of the 218 Pacz filament of the claims in suit. Yet it was not of sufficient value to warrant its being substituted for the badly sagging thoriated filament which was then in use (R. 51).

It was not until Pacz discovered how to produce large grains of a contour that would not offset, that the desired result was accomplished.

There is nothing in the claims or in the specification of the earlier Pacz patent which in the least hints at this invention, as set forth in the Pacz claims in suit. Accordingly, there is no basis whatever for the defense of double patenting. The District Court so held (R. 321, 322). The Circuit Court of Appeals did not pass upon this defense.

POINT III.

There was no prior knowledge or use of the Pacz invention.

Respondents contended below that the Pacz claims in suit are invalid because of the alleged prior knowledge and use of the invention by the Westinghouse Company in 1912, and by the Independent Lamp & Wire Company at some time later than that. This contention was overruled by the District Court for lack of proof (R. 321). The Circuit Court of Appeals did not even mention it.

The evidence offered by the respondents in connection with this defense is extremely "hazy" (to borrow a term

from the District Court's opinion, R. 321). It rests altogether on recollection testimony, and falls far short of the rigorous standards of proof required by this Court in such matters. See the decisions referred to at pages 18, 19, *supra*.

Before discussing these two prior uses separately, we should like to call attention to two facts. The first is that the only witnesses called with respect to either of them were Laise, respondents' expert and supplier of wire, and Cowles. The second is that any assertion that either of these witnesses knew how to produce a non-sag filament prior to the middle of 1916, or had any idea that alkali-silicate (the Pacz addition) should be added for that purpose, is completely negatived by the only bit of dated documentary evidence offered by respondents in this connection. We refer to the memorandum that Laise sent to Cowles July 13, 1916 (R. 301) while both of them were with the Independent Lamp & Wire Company. This memorandum is entitled "Non-Sagging Filament Wire", and was doubtless incited by the fact that petitioner already had on the market its "218" non-sagging filament (R. 28, 229). The memorandum reads:

> "Kindly prepare a number of small batches of metal, about 500 grams to a lot for the production of non-saging filament wire. These batches to contain small percentages of addition products, such that these products will not interfere with the working quality of the metal and yet impart that non-saging effect to the wire.
>
> "I would suggest that we try small percentages of silica of titanium, of lime, of boron or any other addition product that you might consider beneficial for this purpose.
>
> "When you have five lots of these special metals ready, let me have them so that I can have them treated and swaged, and thus be better able to tell the relative working quality of the metals."

The only testimony concerning this memorandum is that Laise said he wrote it and delivered it to Cowles (R. 168), and that Cowles said he received it, and (R. 128)—

"I acted on this letter. I made up some batches."

There is not a word about what batches he made up, or with what result. Therefore, no other conclusion can be reached than that even as late as the Summer of 1916 Laise and Cowles *were still struggling vainly to produce a non-sag filament.* And note particularly that this memorandum contains no suggestion of adding *alkali silicate,* which they learned later from the issuance of the Pacz patent would accomplish what they were after.

The Alleged Use by the Westinghouse Company:

Cowles said he was employed by the Westinghouse Company from 1907 to 1912. That in 1911 or 1912 (R. 118) that company commenced making *drawn* tungsten filament (superseding the prior *squirted* filament), but that not all of the drawn tungsten filament so made was of the thoriated tungsten type (*supra,* p. 5). (The Westinghouse Company was licensed to use the Coolidge invention.) He said (from recollection after 25 years) that they used "four different binders" at that time. His present recollection is they used these same "binders" as "dopes" for the drawn wire, after "dropping" the Battersea process because of its erratic results (R. 118). These binders included, he said, "a sodium silicate or potassium silicate, a water glass solution". It is because "a sodium or potassium silicate" is an alkali silicate, that respondents urge this testimony against the Pacz patent.

There is not a particle of documentary evidence to support this recollection testimony, nor any effort to establish that the filament said to have been produced in this way was a non-sag filament.

Cowles did produce some undated microphotographs which he *said* had been in his possession since 1912 and

represented some "more or less special" lots of material produced by Westinghouse at that time (R. 122).

The first of these microphotographs (Defendants' Exhibit N) shows a coil of filament which Cowles *said* contained "some of the special silicated dope" (R. 121, Q. 43). Cowles said this exhibit showed a "coarse crystalline structure", but Dr. Jeffries pointed out that it actually showed a "fine-grained" structure (R. 220).

The only other micrographs submitted by Cowles, of what he *said* were early Westinghouse filaments, are Defendants' Exhibits O to O-3, inclusive. As to three of these, Defendants' Exhibits O, O-1 and O-3, Dr. Jeffries testified that: "These are not representative of coarse grained so-called interlocking grain structures. They are representative of sections of metal with a number of grains across the entire section. Tungsten filament material having such a structure would not be a non-sag, non-offsetting structure" (R. 220).

Cowles said on direct examination that Defendants' Exhibit O-2 represented a *filament* and that it was of larger magnification than the rest of the O series (R. 124), but on cross-examination, he said they were of the same magnification (R. 132). With respect to Defendants' Exhibit O-2, Dr. Jeffries testified (R. 220-221):

> "That appears to be a typical micrograph of a tungsten *ingot structure.* This particular ingot happens to be fairly coarse grained as indicated by the magnification shown on the back of the microphotograph mounting. It was supposed to be 200 magnifications. *The structure of the ingot has little relation to the structure in the finished filament.* This is a structure before any mechanical working. It can not be said that this structure is typical of a non-sag, non-offsetting structure".[1]

---

[1] Cowles also got mixed up concerning micrographs Defendants' Exhibits P-P3 which are not of filaments at all, but of ingots (R. 221).

It will be seen, therefore, that even if these Defendants' Exhibits O to O-3, had been properly proved as to source and date, which they were not, they would show nothing as to non-offsetting, non-sagging filaments of large crystals, and that in fact they disclose, if anything, a small crystalline structure.

That is all that Cowles had to offer on the Westinghouse alleged prior knowledge or use. And although Laise said he was with Westinghouse throughout 1911 and 1912 when Cowles was there, *he did not corroborate Cowles' testimony.* Laise merely made the bald statement that an alkaline silicate was used in 1913. That is all. No records. No filaments. No lamps. Not even corroboration of Cowles' micrographs. Nothing.

There has been no sufficient proof of prior knowledge or use by Westinghouse of anything even remotely resembling the Pacz invention.

The Alleged Prior Use by the Independent Lamp & Wire Company:

Cowles testified that he was with the Independent Lamp & Wire Company from the Fall of 1912 to 1920. He stated generally, without specifying dates, that certain dopes were used (R. 119):

> "Q. 21. What dopes did you use while with the Independent Lamp & Wire Company?
>
> "A. Thorium nitrate and the sodium and potassium silicates, and tried also alumina, and lime was one of our regular ones, and then *we tried other various experiments,* using boron compounds and some tantalum compounds."

But such general testimony as this can have no place in proving prior use. Cowles was asked what he used "while with the Independent". He was with that company for two years before the petitioner started commercial use of the Pacz invention and *for five years afterwards.* It does not appear, therefore, that Cowles' testimony quoted

above and continuing thereafter is in the least material to the issues of the case because it is not proved that any use took place prior to Pacz's invention.

But it is interesting to note *the number* of things that Cowles was trying during his stay with Independent. As he testified, "We tried *other* various *experiments*". Obviously Cowles was not describing an established *commercial* routine or practice. He was apparently fishing around trying to do the trick, and *experimenting* with this and that.

But the memorandum from Laise to Cowles, already referred to (*supra*, p. 36), shows that up to the middle of 1916, they had not solved the problem. And, even if Pacz's filing date of February, 1917, were taken as the date of the Pacz invention (in spite of Dr. Jeffries' positive testimony that he examined Pacz 218 filament in the Summer of 1915 and that it went into commercial production at that time, R. 229), there is nothing whatever to show that Laise and Cowles had had any greater degree of success between the middle of 1916 and February, 1917.

Cowles testified that he made microphotographs of the Independent wire, and answered in the affirmative the Court's question that in order to complete his study he needed many pictures (R. 124-125). Yet *not one microphotograph was produced.* Nor did he produce a single filament, a single lamp, or a single record of fact or of dates.

Laise also failed to produce any records of any kind. All his testimony amounts to is the mere statement that "in 1916" an alkali silicate was developed when the filament was fired in a silica tube with the addition of lime (R. 147). But Dr. Jeffries clearly pointed out that nothing of the sort would result from such a process (R. 222):

> "* * * The alkaline silicates would not be developed during this firing operation in a silica tube, where lime was added."

And surely, the mere say-so by Laise that this was done "in 1916" does not establish priority over the Pacz invention, which Dr. Jeffries testified was completed and put into commercial use in the Summer of 1915 (R. 229). The burden of proving a prior use is heavily upon the one charging it. Even if the testimony given by Laise, and that given by Dr. Jeffries, could be considered of the same order of credibility, respondents' burden would not be sustained.

These same comments apply to Laise's testimony that the lamp, Defendants' Exhibit Z, was made in October, 1916, and had burned 100 hours without sagging (R. 146, 147). But here, as indicative of the character of Laise's testimony generally, it was brought out on cross-examination that *all he knew about this lamp was that he found it in his trunk with "a tag on it indicating that it had been burned a hundred hours"* (R. 218).

Respondents also referred below to the testimony of Spina to the effect that a lamp which he produced in evidence (Defendants' Exhibit AAA) was made "in 1915" while he was connected with the Independent Lamp & Wire Company and that it had been in his home ever since (R. 185). On direct examination he said that during the more than twenty years that have elapsed since 1915, this lamp "has been used maybe two or three hundred hours, roughly" (R. 185). On cross-examination he said "it has been used very little" (R. 186). Respondents' contention is that the filament in this lamp, of this indefinite history, shows little, if any, sag. No effort was made to show what the grain structure of this filament was, or how it was made, and no documentary evidence was offered to substantiate the assertion that it was made "in 1915". Furthermore, for reasons already stated, the heavy burden of proof that rests upon respondents to establish priority over Pacz, is not sustained by the testimony of Spina that this lamp was made "in 1915", in view of

the testimony of Dr. Jeffries that the Pacz invention was completed in July, 1915 (R. 229).

Conclusion *re* Alleged Prior Uses:

Respondents have failed to produce any credible evidence of knowledge and use of the subject matter of the Pacz claims, prior to the Pacz invention of that subject-matter. They have fallen far short of establishing any such knowledge and use with the certainty required by the rule.

POINT IV.

The Pacz claims in suit are not invalid for indefiniteness, or for insufficiency of disclosure.

This defense that the Pacz claims are void for indefiniteness and insufficiency of disclosure, was urged in the Ninth Circuit case, and overruled by all tribunals there, and was also urged in both of the lower courts in this case, without result.

Definiteness of Claims:

The Pacz claims in suit are adequately definite when read, as all claims must be, in the light of the specification and of the prior art. In the first place the claims specifically relate to a *tungsten* filament, as distinguished from one made of carbon, tantalum, osmium or other material. Next, it is clearly stated that the filament shall be made up of a *number* of grains. This gives it definition from the Schaller single grain filament. Then it is provided that the grains shall be *comparatively large.* This defines the field still more, for the practical art at the time of the Pacz invention was limited to small grained filaments, such as the Coolidge filament (compare Figs. 2

and 5 on the flyleaf). And Pacz states in his specification that the coarseness of the grains gives to the filament its non-sag characteristics (R. 247, l. 61). The last limitation of the claims is that the *size* and *contour* shall be such as to prevent sagging and offsetting. Once more we are led back to the specification which, having stated that the grains are large to avoid sagging, immediately informs the reader that in spite of this the product will not offset. This, as Dr. Jeffries pointed out, means to one skilled in the art a grain contour involving "*grain boundaries* * * * *of such a nature* that they inhibited the slipping action which must occur if a filament is to show the offset phenomena" (R. 27).

As the Court of Appeals for the Ninth Circuit said in regard to these claims (80 F. (2d) 958, 961):

> "The claims do not describe the actual 'size and shape' of the grains, and therefore such description in the specification is immaterial. Further, such description would probably be impossible because of the minuteness of the grains and because each grain varies in 'size and shape' from the other.
>
> "With respect to the failure to describe how the size and shape of the grains prevent offsetting, it would appear that such a description would be describing a scientific theory or principle. Such description might be helpful to one *not* skilled in the art in enabling him to more clearly understand the nature of the invention, but it is immaterial."

To those *skilled* in the art, like the respondents (and the patent is, of course, directed to such), the definition in the claim of the Pacz grain structure is entirely adequate.

Respondents have contended that the statement in the Pacz claims that "substantial" sagging is prevented, renders them fatally indefinite. But respondents' own expert, Laise, showed again and again that the man skilled in the art had no difficulty in understanding, from the practical, commercial, standpoint what was meant by a substantial sag. For example, Laise made some tests before the

Court of some lamps equipped with petitioner's Pacz "218" filament. He hoped to show that that filament itself did not fall within the scope of the Pacz claims. But he was disappointed in that. He had to concede after the tests that this "218" filament was a "commercially non-sag" filament. His testimony in this respect was as follows (R. 161):

> "The Court: What has Exhibit KK done since you held it vertically, describe the filament. Is there any sag in that filament, substantial sag?
>
> The Witness: KK has developed some sag.
>
> The Court: You have been using the word 'substantial'. *Is it substantial?*
>
> The Witness: *I would still call it commercially non-sag.*
>
> The Court: How about LL, is that commercially non-sag?
>
> The Witness: At the present time *that also shows commercially non-sag structure.*"

These same exhibits, having Pacz filaments, were thereafter burned five hours. Laise, in describing the filaments after burning for this length of time, stated that while they had a "droop or sag" the filament in the case of both exhibits showed a *"commercial non-sag filament"* (R. 187).

As previously stated, a patent is addressed to the man skilled in the art. If the respondents' own witness can determine what is a substantially or commercially non-sagging structure surely there is little force to the respondents' argument of indefiniteness of the claims.

The situation here is much like that considered by this Court in *Eibel Process v. Minnesota,* 261 U. S. 45, where the claims under consideration were very similar in character to the Pacz claims here in suit. Claim 1 in the *Eibel* case is typical and reads thus (p. 50):

> "1. A Fourdrinier machine having the breast-roll end of the paper-making wire maintained at a *substantial* elevation above the level, whereby the stock

is caused to travel by gravity, rapidly, in the direction of movement of the wire, and at a speed approximately equal to the speed of the wire, substantially as described."

This Court in sustaining this claim over the defense of "indefiniteness" said (p. 66):

> "* * * Expressions quite as indefinite as 'high' and 'substantial' in describing an invention or discovery in patent specifications and claims have been recognized by this Court as sufficient."

When the *Eibel* patent was before the Circuit Court of Appeals for the Second Circuit, that Court said (234 Fed. 624, 632):

> "It is difficult to lay down a rule, and it is best to confine the test of indefiniteness to the facts of a particular case. Where, as here, the principle of operation is made clear, the pitch is substantially higher than that theretofore known in the art, a different result is accomplished, the subject-matter is incapable of exact expression in feet and inches, and the worker in the art has no difficulty in following the directions, then a claim using the phraseology of claims 1, 2 and 3 will not be held invalid. Any other construction might readily result in depriving a meritorious invention of its commercial value."

The situation as to this Pacz patent has an interesting likeness to the litigation on the Langmuir gas-filled lamp patent No. 1,180,159, a copy of which is in evidence in this case (R. 274). One of the claims of this patent, which was sustained in *General Electric* v. *Mallory*, 298 Fed. 579 (C. C. A. 2), was (R. 277):

> "12. In an incandescent lamp, the combination of the lamp bulb, a tungsten filament therein, and a gaseous filling, the effective diameter of the filament being *sufficiently large* and the heat conductivity of the filling being *sufficiently poor* to permit the lamp to be operated with a filament temperature *in excess of* that

of a vacuum tungsten lamp operating at an efficiency of one watt per candle and with a length of life not less that that of such a lamp."

The Court said (p. 588):

"We considered in our first decision the whole question of the terminology of the claims as well as of the disclosure. It is really covered by the doctrine so thoroughly discussed in Eibel Co. *v.* Minnesota & Ontario Paper Co., 261 U. S. 45, 43 Sup. Ct. 322, 67 L. Ed. 523. Eibel Process Co. *v.* Remington-Martin Co., 234 Fed. 624, 148 C. C. A. 390. The point is that, while critics may point out, and have pointed out, indefiniteness in language, the practical man acquainted with the art has been proven perfectly able presumably to use the patent in making what Langmuir's assignees made first, witness the multitude of infringements productive of litigation. Patents often lend themselves to fine-spun theories; but it is singular how plain they are, if they are worth anything, to the man who wishes to infringe for profit."

The case of *Allen Filter Co.* v. *Star Metal Mfg. Co.*, 30 F. (2d) 693 (D. C., E. D. Pa), was cited below by respondents in support of the defense of invalidity because of indefiniteness of the claims. But this case was reversed on appeal in 40 F. (2d) 252, certiorari denied 282 U. S. 848. The Third Circuit Court of Appeals said at page 254:

"But the resiliency of the metals employed in the prior art is so slight as to be negligible and functionless. Mull employed a coil 'of such resiliency • • • that the coil is not liable to become damaged when a fresh cake of ice is placed in the water cooler, and in contact with the coil.' The difference is not one of degree but in function and result. It is precisely the difference between failure and success. Nor is patentability defeated because the boundary line between coils coming within the patent and those falling outside it is not marked with equatorial precision. It would have been difficult, if not impossible, to mark it more definitely. It is as fixed and certain

as was the boundary in Van Heusen Products *v.* Earl & Wilson (D. C.) 300 F. 922. *It is sufficiently obvious to enable those skilled in the art to locate it.* The law requires nothing more. Eibel Co. *v.* Paper Co., 261 U. S. 45, 43 S. Ct. 322, 67 L. Ed. 523. We think the claims are valid."

So here, as the testimony of respondents' own expert witness shows, the line between a filament which does sag substantially and one which does not, "is sufficiently obvious to enable those skilled in the art to locate it."

The Pacz claims in suit define adequately both the novel *grain structure* and the novel *physical characteristics* of the Pacz filament. They are not void for indefiniteness.

Sufficiency of Disclosure:

On the point of sufficiency of disclosure, respondents contended below that the process described in the Pacz patent will not in fact produce a filament of the character described in the Pacz claims. Just as they offered testimony purporting to show that in *ex parte* tests, the process of the Coolidge patent which was intended to produce fine-grained filament actually produced a filament having a coarse grain, so also they offered testimony that in other *ex parte* tests, the Pacz process which was intended to produce a coarse-grained filament produced a fine-grained one, which sagged. One of the filaments so produced is the one which respondents used for comparison with a boric acid filament (*supra*, p. 32).

This testimony is of no consequence.

The Courts have long realized how easy it is to fail, when one really wants to fail.

As stated by this Court in *Loom Co.* v. *Higgins*, 105 U. S. 580, 586:

"* * * When the question is, whether a thing can be done or not, it is always easy to find persons ready to show how not to do it."

In *Rynear Co.* v. *Evans,* 83 Fed. 696, 697 (C. C., S. D. N. Y.), Judge Coxe said:

> "* * * An experience of 14 years in patent litigation has convinced the Court that when an expert undertakes to prove that his adversary's process or machine is a failure he always scores a success. It is much easier to make a machine that will not work than one that will."

In *A. B. Dick Co.* v. *Barnett,* 288 Fed. 799, 801 (C. C. A. 2), Judge Hough said:

> "* * * We are of opinion that it is advisable to remember first how very easy it is not to do a thing, and how small is the step from not wanting to do a thing to declaring that it cannot be done."

And this is particularly true of *ex parte* tests. Therefore

> "* * * Courts place little weight on *ex parte* demonstrations in any case, but especially is this true with regard to experiments with chemicals." *Kuehmsted* v. *Farbenfabriken,* 179 Fed. 701, 707 (C. C. A. 7).

In contrast with the respondents' attempt to show by *ex parte* tests that the Pacz disclosure will *not* work, we call attention to the testimony of Dr. Jeffries that petitioner used the process precisely as described in the Pacz patent, day in and day out, from 1915 to 1921, in the commercial production of its non-sagging 218 filament, and that ever since 1921, it has used a process which is the same in principle as the one described in the patent, differing only in details in which improvements have been made to facilitate large scale production and to increase the accuracy of control (R. 27, 28, 47, 229). Dr. Jeffries testified also that the product of the precise process of the patent in suit had the same characteristics as the Pacz filament of today (R. 229), and that it was in fact the product described in the Pacz claims in suit (R. 27).

Furthermore, respondents' expert Laise finally admitted to the Court that in his very first trials of the process

described in the Pacz patent, he had scored successes in the majority of cases (R. 205).

Clearly, respondents have not sustained the burden of establishing either indefiniteness or insufficiency of disclosure as a defense against the Pacz claims.

Findings of the Courts below upon Definiteness of Claims and Sufficiency of Disclosure:

Both of the courts below concurred in finding that the disclosure of the Pacz patent was adequate. On the question of the definiteness of the claims, the District Court found them sufficiently definite, and the Circuit Court of Appeals intimated that they were, without specifically deciding the point.

The finding of the District Court was as follows (R. 318):

> "There is a sufficiency of disclosure and the claims are so clearly set forth that one skilled in the art would have no difficulty in making a Pacz filament."

The Court of Appeals said that because the appeal was to be decided on another point it would "assume, without the necessity of deciding, that the claims are not invalid for insufficiency or indefiniteness of disclosure" (R. 334). But it also said (R. 333, 334):

> "* * * In view of the difficulty, if not impossibility, of describing adequately a number of microscopic and heterogeneous shapes of crystals, it may be that Pacz made the best disclosure possible, although it would appear that he could have expressed in millimeters what he meant by 'substantial sagging'. The testimony is that a filament which sags not more than 5 mm. is a commercially 'non-sagging' filament. However, *the process of the patent is adequately described so that one may follow it,* and if the product claims be read to mean a substantially (*i. e.,* a commercially useful) non-sagging and non-offsetting filament having a grain structure such as is produced by following the process of the patent, they would seem to be sufficiently definite to inform the public of the limits of the mo-

nopoly asserted with respect to the product. The same three claims were sustained against a similar contention in *Auraku* v. *General Electric Co.*, 80 F. (2d) 958 (C. C. A. 9), cert. denied 298 U. S. 678."

We urge that those claims should be sustained here also.

Conclusion.

In this brief we have endeavored to show the error of the Circuit Court of Appeals for the Second Circuit in holding the Pacz claims invalid for anticipation by the product of the Battersea process, as described in the Coolidge patent. It seems to us that in making that holding that Court must have overlooked the fact that respondents' expert witness upon whose testimony it relied, was referring not to the Battersea process as described in the Coolidge patent, but to a Battersea process, modified to incorporate the Pacz teachings; and that it must have overlooked also the rule requiring that every reasonable doubt should be resolved against one asserting a defense of this kind.

We have attempted also to anticipate what respondents' position will be upon the various other defenses which they urged in the Court below, and to show that none of those defenses is well founded.

For reasons already stated, we believe that this Pacz patent, which is for a highly meritorious and commercially successful invention—a real contribution to the art—should be held valid and infringed, as all of the Ninth Circuit tribunals and the District Court in this case held it to be.

Respectfully submitted,

HUBERT HOWSON,
MERRELL E. CLARK,
ALEXANDER C. NEAVE,
Counsel for Petitioner.

February, 1938.

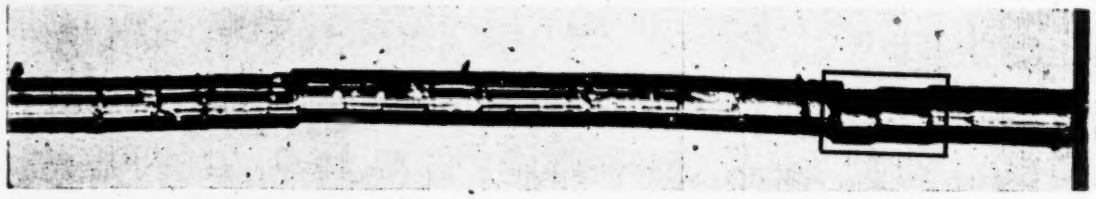
BLANK

PAGE

FIG. 1.

Offsetting Filament.

Microphotograph (Plaintiff's Ex. 12) and Enlarged Diagrammatic Sketch of Indicated Portion.



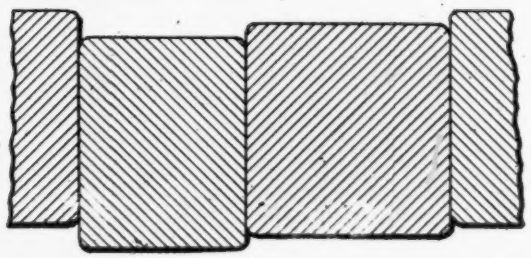


FIG. 2.*

Coolidge Filament-Thoriated.

Microphotograph (Plaintiff's Ex. 19) and Enlarged Diagrammatic Sketch of Indicated Portion.

FIG. 3.

Sagging Coolidge Filament.
(Plaintiff's Ex. 16.)

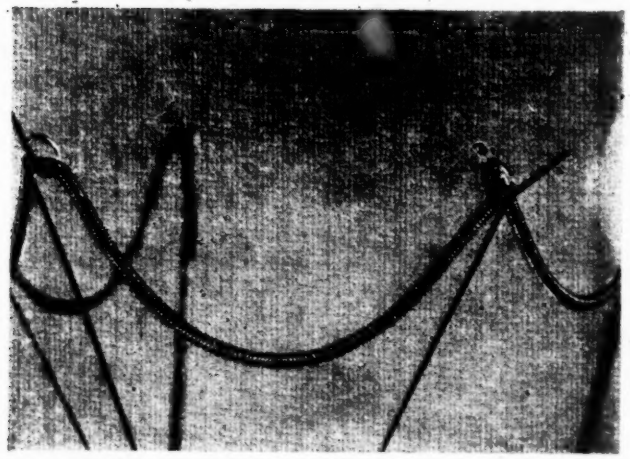
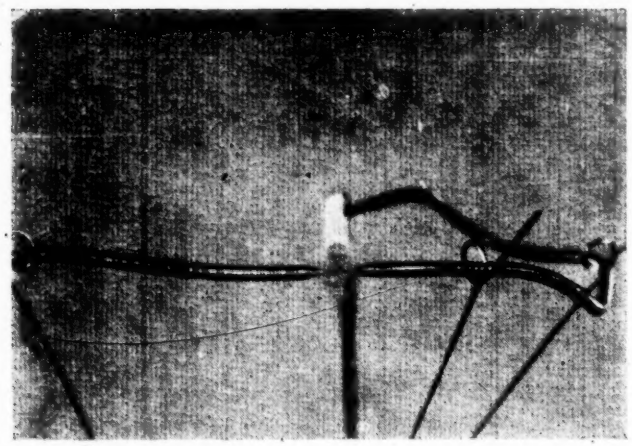


FIG. 4.

Pacz Non-Sagging Filament.
(Plaintiff's Ex. 18.)

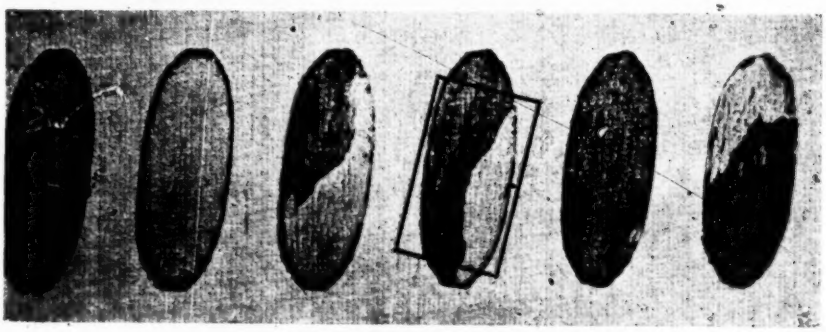


* The actual microphotograph here reproduced was taken broadside of a coil of filament, after the exposed portions of the turns had been partially burnished off to expose the grain structure. Each lozenge shaped section represents the burnished section of a single turn. Plaintiff's Exhibit 15 (physical) is a greatly magnified coil of wire with the exposed portions of the turns burnished off at one side to illustrate how this microphotograph was taken. The enlarged diagrammatic sketch is placed horizontally for comparative purposes.

FIG. 5.*

Pacz Filament.

Microphotograph (Plaintiff's Ex. 19) and Enlarged Diagrammatic Sketch of Indicated Portion.



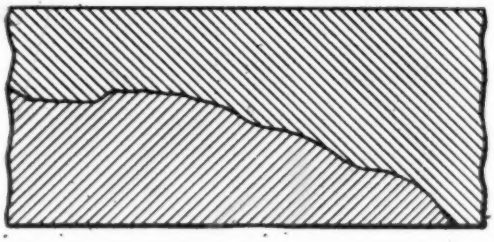


FIG. 6.*

Respondents' Filament.

Microphotograph (Plaintiff's Exhibit 30, p. 14) and Enlarged Diagrammatic Sketch of Indicated Portion.